

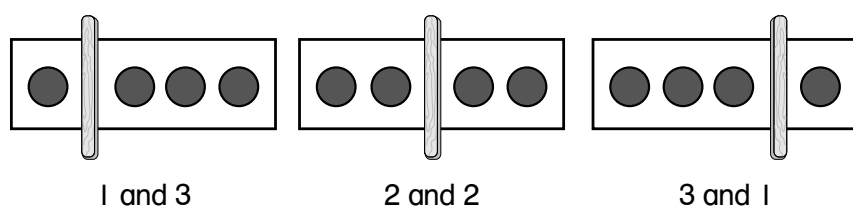
Math Background

Break-Aparts and Partners of a Number

Before children can fully understand addition and subtraction, they must build a detailed knowledge of the embeddedness of numbers. They need to recognize that each number has other numbers “hiding” inside it. Unit 1 initiates this process by developing children’s awareness of the ways in which numbers can be “broken apart” and “put together.” In this way, Unit 1 builds a foundation for the operations and equations that follow in Units 2 and 3.

Building the Concept

Children initially learn about breaking numbers into smaller components by using counters and a Break-Apart Stick to help them see the groups within a group.



Along with these physical supports, children are encouraged to relate break-aparts to their everyday lives by telling their own stories:

- There were 4 nuts under a tree. One belongs to the red squirrel and 3 belong to the gray squirrel.

The two smaller numbers that together make a larger number are referred to as *partners*. The display above shows number 4 has the partners 1 and 3 and also 2 and 2.

Applying the Concept

Once children understand the concept of embeddedness, they need to learn exactly what partners are “hiding” within each number. Math Expressions uses a variety of activities to help children master the partner pairs through number ten.

Scenarios

Active role-playing allows children to generate and name the partners of each number. In the *Leaping Lambs* scenario, a group of children jump over a “fence” (a piece of masking tape or yardstick) one at a time to reveal the partners of any particular total.

In another scenario, called the *Melon Monster*, one child pretends to be a monster that eats melons when the other children’s eyes are closed. Children then use Stair Steps to discover how many were eaten.

This represents a conceptual advance because children are actually solving a problem by finding an unknown number. This helps build the foundation for the algebraic approach to problem-solving that is used throughout the *Math Expressions* program.

Leaping Lambs



Five little lambs playing in the clover.
One saw the fence and jumped right over.
Now four little lambs are in the clover,
And one little lamb is over.

Melon Monster

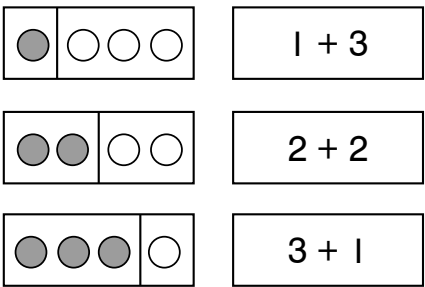


There were 8 melons. Now there are 5. How many did the Melon Monster eat?

Teaching Unit 1 (Continued)

Paper and Pencil Applications

Circle drawings are used to illustrate addition expressions as children are introduced to the plus sign. Children first draw the “break-apart line” and then color the circles to show the different partners. Children also learn to switch the partners and see how $1 + 3$ and $3 + 1$ are related.



Counting, Grouping, and Patterning

The opening 5 minutes of each math period are dedicated to Quick Practice activities which are often directed by Student Leaders. These activities are especially important in helping children gain speed and automaticity in counting and patterning. Although unitary counting is important, children need to move quickly into visualizing numbers in groups of 5 and 10. This prepares them to understand place value and to add and subtract numbers mentally. Eventually all children become Student Leaders, increasing their social competence and confidence.

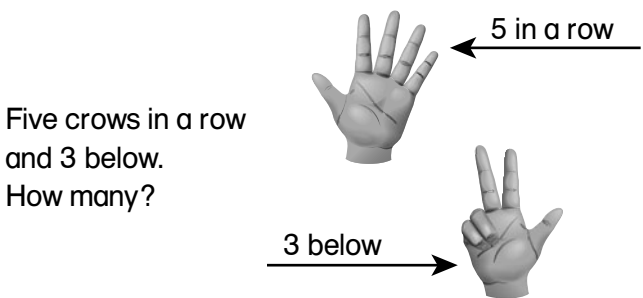
Visualizing Fives

Math Expressions offers many ways for children to see 5-structured groups. The Number Parade that is displayed in the front of the room relates numerals to 5-structured dots. Both the Number Parade and the related Giant Number Cards with dots on the back are used in several Quick Practice activities.



Number Parade

Many Quick Practice activities involve rhymes that are enjoyable and easy for children to remember. *Five Crows in a Row* allows children to use their fingers to practice the 5-groups and totals.



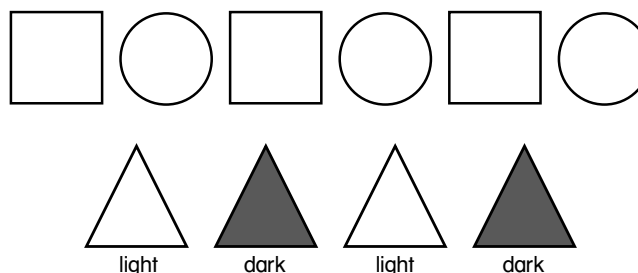
Repeated Patterns

Number writing practice includes the introduction to repeated numeric patterns. In addition to numbers, children also use sounds (clap-stomp, clap-stomp) and words (pig-cow-duck, pig-cow-duck) to generate patterns.

3 5 5 3 5 5

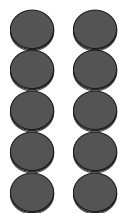
Geometric Figures

The concept of patterns is extended as children learn to draw and name simple geometric shapes and to describe their attributes. The number of sides on a geometric figure reinforces the early number activities. Triangles, for example, are taught with the number 3.

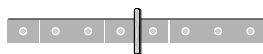


Size Relationships

Numbers can also be patterned and sequenced by understanding how they are related by size. In this unit children begin to explore such concepts as *equal*, *double*, *more*, and *less*.



5 and 5 are doubles.



4 and 4 are equal.

Children use various lengths of Stair Steps to find 1-more and 1-less patterns. The sequence of all the Stair Steps illustrates these relationships in a way that is easy to visualize. The pattern is recited and enjoyed by the children.

1 and 1 more is 2.

2 and 1 more is 3.

3 and 1 more is 4, and so on.

The sequence is then reversed.

10 and 1 less is 9.

9 and 1 less is 8.

8 and 1 less is 7, and so on.

